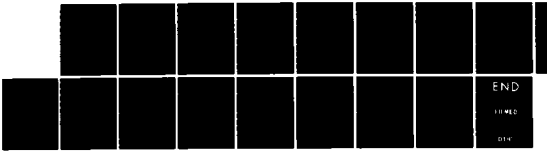
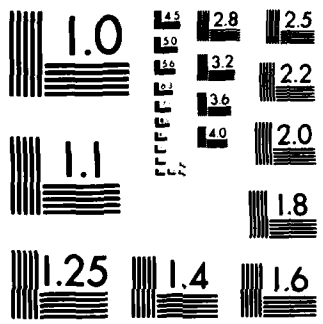
AD-A152 816 COST SHARING FOR MEDICAL CARE SERVICES(U) RAND CORP SANTA MONICA CA J P NEWHOUSE 12 JUN 84 RAND/P-6997 1/1

UNCLASSIFIED F/G 6/5 NL






MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS 1963-A

AD-A152 816

DTIC FILE COPY

(2)

# COST SHARING FOR MEDICAL CARE SERVICES

Joseph P. Newhouse

June 1984

DTIC
ELECTE
APR 26 1985
D

P-6997

DISTRIBUTION STATEMENT A
Approved for public release;
Distribution Unlimited

033

Statement of

Joseph P. Newhouse
Head, Economics Department
The Rand Corporation

to

Subcommittee on Defense of the
United States Senate Appropriations Committee

June 12, 1984

Accession For
NTIS GRA&I ☑
DTIC TAB ☐
Unannounced ☐
Justification
By
Distribution/
Availability Codes
Dist | Avail and/or Special
A-1

DTIC COPY INSPECTED 3

Mr. Chairman, members of the Committee, it is an honor to be asked to testify today on the issue of cost sharing for medical care services. For the past ten years I have directed the Rand Health Insurance Study, an experiment to learn the effects of requiring families to pay for a portion of their medical care services. We have studied effects on both families' use of services and on their health status. The experiment has been supported by the Office of the Assistant Secretary for Planning and Evaluation in the Department of Health and Human Services. Nearly $80 million of federal monies have gone into this project, and I hope that the facts I am about to present represent a partial return on that investment.

## Design of the Experiment

The experiment, which took place between 1974 and 1982, enrolled 7703 persons in 2757 families in six different sites of the United States -- Seattle, Washington; Dayton, Ohio; Charleston, South Carolina; Fitchburg, Massachusetts; and two non-metropolitan sites, Franklin County, Massachusetts and Georgetown County, South Carolina. Most of these people were enrolled in so-called fee-for-service insurance plans. They could seek care from any physician who agreed to treat them, but the portion of their medical bills that they paid varied, from nothing to 25, 50, or 95 percent. Families' maximum out-of-pocket expense in a year could not exceed $1000, or 5,10, or 15 percent of income, whichever was less. (Families were randomized to the percentage of income limitation.) Additionally, some families paid 95 percent of their outpatient bills up to $150 per person; inpatient services to these families were free. Finally, some Seattle families agreed to change their physician and seek care at a Health Maintenance Organization, the Group Health Cooperative of Puget Sound, and some Seattle families who were already receiving care at the Cooperative agreed to participate in the experiment, although they continued to receive care at the Cooperative.

The experimental insurance plans covered almost all medical and dental services. Families participated for either three years (70 percent) or five years (30 percent). Persons 62 years of age and over

were not enrolled, nor were active duty or retired military personnel and their dependents, nor were those eligible for Medicare because of disability.

## Summary of Cost Sharing's Effect on the Use of Services

The experiment has generated a number of results with respect to how families used services. The results cited below are based on the first 40 percent of the data received, but preliminary analyses with the remainder of the data suggest that the final results will be quite similar. The most important result concerning use was:

1) The use of services varied a great deal across insurance plans (Table 1). Families for whom all medical services were free spent about 50 percent more than families on the least generous plan (the plan that required families to pay 95 percent of their bills up to a $1000 maximum).

The change in use can be described more fully:

2) The increase in use was approximately equiproportionate for children and adults, although it was a bit less for children (Table 2). It was also approximately equiproportionate across income groups; that is, poor and reasonably well-to-do families all increased their use of services by about the same amount (Table 3).

3) All groups increased their rate of physician visits; on average visits increased from about 3.5 per year to about 5.5 per year as the generosity of the plan varied (Table 4).

4) Hospital admissions increased among adults when all care was free. About 13 percent of those on the free care plan were hospitalized, whereas only 8 to 10 percent of those on the other plans were hospitalized (Table 5). Another way to say this is that hospital admissions were some 30 to 50 percent greater on the free care plan. Hospital admission rates for children appeared unaffected by cost sharing, which is why the response of children to the insurance plan is somewhat less than for adults.

5) The plan with costly outpatient services and free inpatient services had 22 percent fewer hospital admissions than the plan in which all services were free (Table 5). Thus, our results do not bear out the sometimes heard statement that deterring the use of office visits through cost sharing results in higher hospital charges.

## Summary of Results with Respect to Health Outcomes

A natural question to ask is how these changes in use affected health outcomes. To date results are only available on those age 14 and older, but preliminary work with the data for children suggests that similar results hold for children as well.

1) The average person's health changed very little, despite the rather large change in use caused by the insurance plan (Table 6). To date we have compared the outcomes in each insurance plan for eleven measures of health. Virtually no differences were detected within the group of plans that required cost sharing. Some differences were detected between the plan with free care and the group of plans that required cost sharing. On the free care plan the average person's diastolic blood pressure was 0.7 millimeters of Mercury lower than on the cost sharing plans. Corrected far vision for those who did not have natural 20/20 vision also improved; at the end of the experiment those on the free care plan had corrected far vision of 20/22 as opposed to 20/22.5 among those on the cost sharing plans. On nine other measures we could not reject the possibility that there was, in fact, no change, but we could reject the possibility that we had failed to detect (because of too small a sample size) a large change. For example, we can be reasonably certain that a measure of self-assessed health did not improve by more than 0.3 units (indeed, it is more likely to have decreased than improved). To put these units in context, about 10 years of age causes a fall of about 2.0 units in this measure, while a diagnosis of hypertension (high blood pressure) causes a fall of about 5.0 units.

2) The improvements that did occur were concentrated in low income, sick individuals (Tables 7, 8). For example, diastolic blood pressure improved by 3 millimeters of Mercury in the free plan relative to the other plans for those persons in the highest quartile of blood pressure and who were in the lowest 20 percent of the income distribution (an average of $7300 family income in 1982 dollars). Largely because of the improved control of blood pressure, the risk of death fell among those at the highest risk of death (the highest quarter of the distribution), from 2.1 times the average risk in the cost

sharing plans to 1.9 times the average risk in the free care plan (Table 7). (There was no change in the risk of dying for the average person, as shown in Table 6.)

3) Health habits that are associated with cardiovascular diseases and some forms of cancer were unchanged by the greater frequency of visits to physicians (Table 6). Specifically, free care, which led to one to two more encounters with a physician each year for several years, had no effect on the number of cigarettes smoked, weight, or cholesterol levels.

4) Analyses of other health outcome measures, including dental care, other physiologic measures of health outcome, and disability days are in process.

## Summary of Results for the Health Maintenance Organization (HMO)

The analysis of the Health Maintenance Organization principally compared those who had been randomly assigned to receive care at the Organization (with no cost sharing) with those who received care in the fee-for-service system with no cost sharing. The most important finding was:

1) The estimated value of services delivered to the HMO group was 28 percent less than delivered to the comparable fee-for-service group, the free care group (Table 9). The principal cause of the difference was in the hospital admission rate, which was 40 percent less in the HMO group than in the free care fee-for-service group (Table 10).

2) Although the number of preventive visits was higher at the HMO (Table 10), this does not appear to account for the reduced expenditure. Among the fee-for-service plans, the number of preventive visits was higher in the plans with free care than in the plans that required cost sharing, but the hospitalization rate was higher, not lower, in the free care plan (Tables 5 and 10).

3) The markedly lower rate of hospitalization appears to reflect a different style of medicine.

4) Analysis of data on health status and patient satisfaction at the HMO compared with fee-for-service is in process.

## Are These Results Applicable to Dependents and Retirees Among the Military Population?

As noted above, those with access to the military medical care system were excluded from the population studied. (We excluded such individuals because we could not treat as equivalent an individual who had to pay 50 percent of his bill in the civilian system with no access to the military system and a similar individual with such access.) Because of the exclusion, a question arises as to the applicability of the results just described to dependents of active duty military personnel and retirees.

The answer to that question is, of course, judgmental, but my judgment is that if an experiment were repeated with the military population, similar results would be found. Broadly speaking, the experiment enrolled a representative sample of the non-aged population. It found that different types of people (e.g., high income, low income, living in large city, living in small city) all responded similarly to cost sharing. Thus, the reduced use from cost sharing could reasonably be expected in a military population. The military population is a relatively healthy population and that group showed little benefit from the additional services sought when care was free. Only 8 percent of the users of military facilities are over 65 years of age, the group for whom extrapolation of the experimental results is most problematical. In short, if one regards the military population as not very dissimilar from most employed populations, one would expect that these results would also apply to the military population.

## What Objections Have Been Raised to the Results?

Little or no objection has been raised to the utilization results. The finding that more complete coverage of outpatient services increases hospital admissions and hence increases expenditure conflicts with a finding from a study in a California Medicaid population which showed the opposite result. The California study, however, was not a true experiment; i.e., the two groups that were compared were not similar, and the dissimilarity could have accounted for the result. In addition to our study, there has been one other true experiment conducted to study this issue; its findings were similar to ours.

The major criticism that I am aware of concerns the adequacy of the measures of health outcome. Dr. Arnold Relman, editor of the *New England Journal of Medicine*, though describing the project as a "landmark study" and a "valuable and massive undertaking," has commented that "only a few limited measures of health and adequacy of medical care were used" and that the duration of the study was "too short to reveal possible long-term cumulative effects of reduced medical services." I disagree with both of these comments.

Although we have not analyzed all the measures of health that we will ultimately have available (as noted above), those that we have analyzed cannot fairly be described as limited. They include a global measure of physical health (meaning the capacity to engage in physical activity, limitations on mobility, ability to care for oneself, etc.), a global measure of mental health, and a global overall self-assessment of health. The term limited implies that we did not examine important dimensions of health outcomes, which simply is not the case. It is true that to date we have only examined a few measures of physiological health, but those few are for relatively common problems (vision, hypertension, and hypercholesterolemia), and I see no reason to think results for the measures yet to be examined (acne, anemia, allergic conditions, angina, chronic obstructive airway disease, congestive heart failure, convulsions, diabetes mellitus, hay fever, hearing disorders, joint disorders, otitis media, peptic ulcer disease, thyroid disease, and urinary tract infection) would be markedly different. We are attempting to understand more about why certain results did or did not occur; for example, we are examining whether those with high blood pressure saw a physician at all and, if they did, whether physicians treated those on different insurance plans differently.

Was the experiment too short? Might we have missed long-term cumulative effects of additional medical care? One reason we examined physiologic measures of health such as blood pressure and health habits such as cigarette smoking was that they are predictive of future health. A key question, therefore, is whether continued additional medical care would have further changed these measures. Would a smoker, who was seeing a physician one to two more times per year for three to five

years and who had not altered his smoking habits, alter them if he or she saw a physician one to two more times per year for ten or twenty years? If a person with high blood pressure did not have his or her blood pressure controlled after three to five years, would it be controlled after ten years? In both cases the answer is a matter of opinion; I doubt that a longer term experiment would have produced different results.

Yet another issue concerns the reliability and validity of self-assessed measures of health. We have published numerous monographs on this issue that are referenced at the end of my testimony and that I will submit to staff; the evidence in the monographs shows that the measures are reliable and, as best we can tell, do in fact measure the components of health they purport to measure.

## A Concluding Thought

This study addressed the questions: Does requiring families to pay for their medical care cause them to consume less? If so, do the reductions affect their health status? The answer to the first question is unambiguously yes. The answer to the second is yes, but to a limited degree, especially among relatively healthy populations. We did not address other questions that are relevant to decisions about cost sharing for dependents of active duty military personnel and retirees.

One such question is the effect on recruitment and retention efforts. Clearly additional cost sharing lessens the attractiveness of a military career, but two devices used in the experiment may be helpful in offsetting this diminution. First, no family was at risk for a catastrophic financial loss; second, families who could have been worse off by enrolling (because their existing health insurance was more generous than the experimental plan) were paid a lump sum amount to induce them to enroll. In the present context, such a side payment amounts to an adjustment to pay scales to compensate for the increased cost sharing. One natural question is whether an adjustment could be large enough to compensate for the increased cost sharing and still save the government money. The answer to that question is yes on average; some individual families would come out ahead (namely, those who used few or no services) while others would come out behind (those who used

many medical services), but aggregate compensation paid to families could be increased enough to cover the cost sharing and the government would save the cost of the foregone medical care services.

Further information about the experiment can be obtained in the following publications:

Newhouse, J.P., W.G. Manning, C.N. Morris, et al., Some Interim Results from a Controlled Trial of Cost Sharing in Health Insurance, The Rand Corporation, R-2847-HHS, January 1982. Also in *New England Journal of Medicine,* 305:1501-1507, December 17, 1981.

Brook, R.H., J.E. Ware, W.G. Rogers, et al., "Does Free Care Improve Adults' Health? Results from a Randomized Controlled Trial, *New England Journal of Medicine,* 309:1426-1434, December 8, 1983.

Manning, W.G., A. Leibowitz, G. Goldberg, W. Rogers, and J.P. Newhouse, "A Controlled Trial of the Effect of a Prepaid Group Practice on Use of Services," *New England Journal of Medicine* 310; 1505-10, June 7, 1984.

The measures of health status are described in the following publications:

## Physiologic Measures

Brook, R.H., K.N. Lohr, G.A. Goldberg, et al., *Conceptualization and Measurement of Physiologic Health for Adults: Acne,* The Rand Corporation, R-2262/2-1-HHS, August 1980.

Brook, R.H., D.M. Berman, K.N. Lohr, et al., *Conceptualization and Measurement of Physiologic Health for Adults: Hypertension,* The Rand Corporation, R-2262/3-HHS, August 1980.

Berman, D.M., R.H. Brook, K.N. Lohr, et al., *Conceptualization and Measurement of Physiologic Health for Adults: Angina Pectoris,* The Rand Corporation, R-2262/4-HHS, June 1981.

Rosenthal, M., K.N. Lohr, R.S. Rubenstein, et al., *Conceptualization and Measurement of Physiologic Health for Adults, Congestive Heart Failure,* The Rand Corporation, R-2262/5-HHS, September 1981.

Scott, B., G.A. Goldberg, R.H. Brook, K.N. Lohr *Conceptualization and Measurement of Physiologic Health for Adults: Anemia,* The Rand Corporation, R-2262/6-HHS, August 1980.

Brook, R.H., K.N. Lohr, D.M Berman, et al., *Conceptualization and Measurement of Physiologic Health for Adults: Diabetes Mellitus,* The Rand Corporation, R-2262/7-HHS, January 1981.

Foxman, B., K.N. Lohr, R.H. Brook, et al., *Conceptualization and Measurement of Physiologic Health for Adults: Chronic Obstructive Airway Disease,* The Rand Corporation, R-2262/8-1-HHS, September 1982.

Brook, R.H., K.N. Lohr, G.A. Goldberg, *Conceptualization and Measurement of Physiologic Health for Adults: Thyroid Disease,* The Rand Corporation, R-2262/9-HHS March 1982.

Scott, B., R.H. Brook, K.N. Lohr, G.A. Goldberg, *Conceptualization and Measurement of Physiologic Health for Adults: Joint Disorders,* The Rand Corporation, R-2262/10-HHS, December 1981.

Brook, R.H., K.N. Lohr, E.B. Keeler, et al., *Conceptualization and Measurement of Physiologic Health for Adults, Hypercholesterolemia,* The Rand Corporation, R-2262/11-HHS, September 1981.

Rubenstein, R., K.N. Lohr, R.H. Brook, et al., *Conceptualization and Measurement of Physiologic Health for Adults: Vision Impairments,* The Rand Corporation, R-2262/12-HHS July 1982.

Beck, S., R.H. Brook, K.N. Lohr, G. A. Goldberg, *Conceptualization and Measurement of Physiologic Health for Adults: Hay Fever,* The Rand Corporation, R-2262/13-HHS, July 1981.

Beck, S., R.H. Brook, K.N. Lohr, and G.A. Goldberg, *Conceptualization and Measurement of Physiologic Health for Adults: Hearing Loss,* The Rand Corporation, R-2262/14-HHS, August 1981.

Rubenstein, R.S., S. Beck, K.N. Lohr, et al., *Conceptualization and Measurement of Physiologic Health for Adults: Surgical Conditions,* The Rand Corporation, R-2262/15-HHS, May 1983.

Zielske, J., K.N. Lohr, R.H. Brook, and G. Goldberg, *Conceptualization and Measurement of Physiologic Health for Adults: Urinary Tract Infection,* The Rand Corporation, R-2262/16-HHS, May 1981.

Zielske, J., et al., *Conceptualization and Measurement of Physiologic Health for Adults: Stomach Pain and Peptic Ulcer Disease,* The Rand Corporation, R-2262/17-HHS, February 1983.

Beck, S., K.N. Lohr, C.J. Kamberg, et al, *Measurement of Physiologic Health for Children: Allergic Conditions,* The Rand Corporation, R-2898/1-HHS, 1983.

Lohr, K.N., S. Beck, C.J. Kamberg, et al., *Conceptualization and Measurement of Physiologic Health for Children: Middle Ear Disease and Hearing Impairment,* The Rand Corporation, R-2898/2-HHS, October 1983.

Kamberg, C. J., K. N. Lohr, R.H. Brook, and G.A. Goldberg, *Conceptualization and Measurement of Physiologic Health for Children: Seizure Disorders,* The Rand Corporation, R-2898/3-HHS, July 1983.

Foxman, B., K.N. Lohr, R.H. Brook, *Conceptualization and Measurement of Physiologic Health For Children: Anemia,* The Rand Corporation, R-2898/5-HHS, January 1983.

## Self Assessed Measures

Ware, J.E., Jr., R.H. Brook, A. Davies-Avery, et al., *Conceptualization and Measurement of Health for Adults in the Health Insurance Study: Model of Health and Methodology,* The Rand Corporation, R-1987/1-HEW, May 1980.

Stewart, A.L., J.E. Ware, Jr., R.H. Brook, et al., *Conceptualization and Measurement of Health for Adults in the Health Insurance Study: Physical Health in Terms of Functioning,* The Rand Corporation, R-1987/2-HEW, July 1978.

Ware, J.E., Jr., S.A. Johnston, A. Davies-Avery, and R.H. Brook, *Conceptualization and Measurement of Health for Adults in the Health Insurance Study: Mental Health* The Rand Corporation, R-1987/3-HEW, December 1979.

Donald, C.A., J.E. Ware, R.H. Brook, and A. Davies-Avery, *Conceptualization and Measurement of Health for Adults in the Health Insurance Study: Social Health,* The Rand Corporation, R-1987/4-HEW, August 1978.

Ware, J. E., Jr., A. Davies-Avery, and C. A. Donald, *Conceptualization and Measurement of Health for Adults in the Health Insurance Study: General Health Perceptions,* The Rand Corporation, R-1987/5-HEW, September 1978.

Ware, J.E., Jr., A. Davies-Avery, and R.H. Brook, *Conceptualization and Measurement of Health for Adults in the Health Insurance Study,* Vol. VII: *Analysis of Relationships Among Health Status Measures,* The Rand Corporation, R-1987/6-HEW, November 1980.

Rogers, W.H., K.N. Williams, and R.H. Brook, *Conceptualization and Measurement of Health for Adults in the Health Insurance Study: Power Analysis for Health Status Measures,* The Rand Corporation, R-1987/7-HEW, March 1979.

Brook, R.H., J.E. Ware, Jr., A. Davies-Avery, et al., *Conceptualization and Measurement of Health for Adults in the Health Insurance Study: Overview,* The Rand Corporation, R-1987/8-HEW, October 1979. Also appeared in *Medical Care,* #17 (Supplement), 1979, as "Overview of Adult Health Status Measures Fielded in Rand's Health Insurance Study."

Eisen, M. B., et al., *Conceptualization and Measurement of Health for Children in the Health Insurance Study,* The Rand Corporation, R-2313-HEW, May 1980.

Stewart, A. L., R. H. Brook, and R. L. Kane, *Conceptualization and Measurement of Health Habits for Adults in the Health Insurance Study: Smoking,* The Rand Corporation, R-2374/1-HEW, June 1979.

Stewart, A. L., R. H. Brook, and R. L. Kane, *Conceptualization and Measurement of Health Habits for Adults in the Health Insurance Study: Overweight,* The Rand Corporation, R-2374/2-HEW, July 1980.

Stewart, A. L., J. E. Ware, Jr., and R. H. Brook, *Construction and Scoring of Aggregate Functional Status Measures,* Vol. I, The Rand Corporation, R-2551-1-HHS, August 1982.

Davies, A. R., and J. E. Ware, Jr., *Measuring Health Perceptions in the Health Insurance Experiment,* The Rand Corporation, R-2711-HHS, October 1981.

Donald, C. A., and J. E. Ware, Jr., *The Quantification of Social Contacts and Resources,* The Rand Corporation, R-2937-HHS, October 1982.

TABLE 1

ACTUAL ANNUAL TOTAL AND AMBULATORY EXPENDITURE PER PERSON, BY PLAN: NINE SITE-YEARS

| Plan | Total Expenditure | Ambulatory Expenditure | Number of Person-Years for Total Expenditure | Number of Person-Years for Ambulatory Expenditure[a] |
|---|---|---|---|---|
| Free care | $401 (±52) | $186 (±9) | 2825 | 2834 |
| 25-percent coinsurance | 346 (±58) | 149 (±10) | 1787 | 1792 |
| 50-percent coinsurance | 328 (±149) | 120 (±12) | 766 | 766 |
| Family Deductible, 95-percent coinsurance | 254 (±37) | 114 (±10) | 1763 | 1764 |
| Individual Deductible, 95-percent coinsurance[b] | 333 (±74) | 140 (±11) | 1605 | 1609 |

NOTE: 95-percent confidence intervals are shown in parentheses. Dollars are current dollars, beginning in late 1974 and extending through late 1978. The figures are uncorrected for site price-level differences or for small differences in allocation to plan by site. Confidence intervals are uncorrected for intertemporal and intrafamily correlation; such a correction cannot be made without imposing strong assumptions about the nature of the correlation. Ignoring intertemporal and intrafamily correlation, the F-value to test the null hypothesis of no differences among the plans in total expenditure with 4,8741 degrees of freedom is 3.14, significant at the 5-percent level. The F-value to test the null hypothesis of no differences among the plans in ambulatory expenditure is 33.4, significant at well under the 1-percent level.

[a]The sample for ambulatory expenditure includes 19 individuals with a known hospital admission for whom the amount of inpatient expenditure is missing.

[b]Coinsurance in this plan applies to outpatient care only; inpatient care is free.

TABLE 2

PREDICTED EXPENDITURE, BY PLAN AND AGE GROUP: YEAR 1

(Dollars for free plan; percentage of free plan elsewhere)

| Plan | Dayton | | Seattle | | Fitchburg | | Franklin County | |
|---|---|---|---|---|---|---|---|---|
| | Adult | Child | Adult | Child | Adult | Child | Adult | Child |
| Free care | $555 (±91) | $196 (±32) | $500 (±76) | $174 (±27) | $521 (±95) | $185 (±34) | $507 (±92) | $186 (±32) |
| 25-percent coinsurance | 75% | 77% | 84%* | 91%† | 88%† | 98%† | 81%* | 89%† |
| 50-percent coinsurance | 62 | 71 | — | — | 68 | 82† | 74* | 93† |
| 95-percent coinsurance | 69 | 69 | 72 | 75 | 75 | 78* | 66 | 69 |
| Individual Deductible, 95-percent coinsurance[a] | 76 | 75 | 85* | 89† | 81* | 83† | 81* | 86* |

NOTE: 95-percent confidence intervals are shown in parentheses. If no symbol appears to the right of the number, the difference from the free plan is significant at the 1-percent level (one-tail test). An asterisk (*) indicates that the value is significant at the 5-percent level; a dagger (†) indicates that the value is not significant at the 5-percent level.

[a]Coinsurance applies to outpatient care only; inpatient care is free.

## TABLE 3

### PREDICTED EXPENDITURE, BY INCOME TERTILE AND PLAN: YEAR 1
(Dollars for free plan; percentage of free plan elsewhere)

| Plan | Dayton | | Seattle | | Fitchburg | | Franklin County | |
|---|---|---|---|---|---|---|---|---|
| | Low | High | Low | High | Low | High | Low | High |
| Free care | $395 (±67) | $446 (±69) | $384 (±59) | $381 (±57) | $403 (±73) | $367 (±65) | $391 (±69) | $368 (±64) |
| 25-percent coinsurance | 71% | 78% | 85%* | 85%* | 89%† | 90%† | 82%* | 83%* |
| 50-percent coinsurance | 60 | 67 | — | — | 71 | 71 | 77* | 78* |
| 95-percent coinsurance | 65 | 72 | 72 | 73 | 75 | 76 | 65 | 67 |
| Individual Deductible, 95-percent coinsurance[a] | 73 | 78 | 86* | 86* | 81* | 82* | 81 | 82* |

NOTE: 95-percent confidence intervals are shown in parentheses. Comparisons do not hold factors constant other than income; they simply compare predictions for actual families with incomes below $9548 and above $15,264 (1972 dollars) in Dayton; below $8222 and above $13,882 (1973 dollars) in Seattle; below $8884 and above $13,033 (1973 dollars) in Fitchburg; and below $9374 and above $13,155 (1973 dollars) in Franklin County. These values define the lower third and upper third of the income distribution for the site. If no symbol appears to the right of the number, the difference from the free plan is significant at the 1-percent level. An asterisk (*) indicates that the difference is significant at the 5-percent level; a dagger (†) indicates that the difference is not significant at the 5-percent level. All tests are one-tail tests. Standard errors are corrected for intrafamily correlations.

[a]Coinsurance applies to outpatient care only; inpatient care is free.

## TABLE 4

### AMBULATORY EXPENDITURE RATES AND OFFICE VISIT RATES PER PERSON, BY PLAN: DAYTON, YEAR 2

| Plan | Ambulatory Expenditure Rates (Free plan = 100) | Office Visit Rates[a] (Free plan = 100) |
|---|---|---|
| Free care | $188 (100) | 5.4 visits (100) |
| 25-percent coinsurance | ( 78) | 4.4 visits ( 81) |
| 50-percent coinsurance | ( 59) | 3.2 visits ( 59) |
| 95-percent coinsurance | ( 68) | 3.7 visits ( 69) |
| Individual Deductible, 95-percent coinsurance | ( 67) | 3.7 visits ( 68) |

NOTE: All differences in expenditure and visits between the free plan and other plans are significant at the 1-percent level except the differences between the free and 25-percent coinsurance plans for ambulatory expenditures, which are significant at the 5-percent level using a one-tail test. Standard errors are corrected for intrafamily correlation.

[a]Visits are defined from claims. A visit is any outpatient service performed by an M.D. or D.O. or his staff for a given patient on a single day. Nonbilled services such as telephone visits or visits to industrial clinics are not counted as visits by this definition.

## TABLE 5

### ANNUAL PROBABILITY OF ONE OR MORE HOSPITAL ADMISSIONS, BY PLAN AND AGE GROUP

| Plan | Child (17 years or under)[a] | Adult (Over 17 years) |
|---|---|---|
| Free care | .056 (±.015) | .133 (±.018) |
| 25-percent coinsurance | .047 (±.017) | .104 (±.020) |
| 50-percent coinsurance | .057 (±.029) | .082 (±.028) |
| 95-percent coinsurance | .045 (±.017) | .095 (±.020) |
| Individual Deductible, 95-percent coinsurance[b] | .065 (±.023) | .104 (±.019) |

NOTE. 95-percent confidence intervals are shown in parentheses. For adults, 50- and 95-percent coinsurance values are significantly different from the free plan value at the 1-percent level, and the 25-percent and Individual Deductible values are significantly different at the 5-percent level. For children, no plan difference is significant at conventional levels. All tests are one-tail tests. Standard errors are corrected for intra-family and intertemporal correlations.

[a]The mean for children in our plans is .054 (±.008); the national mean is .050 (±.004) (Newhouse, 1974).

[b]This plan has zero coinsurance (free care) for inpatient services.

Table 6 Predicted Exit Values of Health-Status Measures for an Average Person According to Measure and Plan, and Raw Mean Difference.

| HEALTH-STATUS MEASURES | NO.* | COST SHARING PLANS | | | | FREE PLAN | PREDICTED MEAN DIFFERENCE (free minus cost sharing)† | RAW MEAN DIFFERENCE (free minus cost-sharing) |
|---|---|---|---|---|---|---|---|---|
| | | CATASTROPHIC | INTERMEDIATE | INDIVIDUAL DEDUCTIBLE | TOTAL | | | |
| General health (score, 1–100) | | | | | | | | |
| Physical functioning | 3862 | 86.0 | 85.0 | 84.9 | 85.3 | 85.3 | 0.0 (−1.6, 1.5) | −0.3 (−2.3, 1.7) |
| Role functioning | 3861 | 95.5 | 95.0 | 94.7 | 95.1 | 95.4 | 0.3 (−0.6, 1.2) | −0.3 (−2.2, 1.6) |
| Mental health | 3862 | 75.6 | 75.5 | 75.8 | 75.6 | 75.5 | −0.2 (−1.1, 0.8) | −0.1 (−1.1, 1.0) |
| Social contacts | 3827 | 69.3 | 70.2 | 69.8 | 69.8 | 69.4 | 0.3 (−2.3, 1.6) | −0.2 (−2.4, 2.0) |
| Health perceptions | 3843 | 68.1 | 68.0 | 67.9 | 68.0 | 67.4 | 0.6 (−1.5, 0.3) | 0.9 (−2.1, 0.3) |
| Health habits | | | | | | | | |
| Smoking (scale, 1–2.20) | 3758 | 1.28 | 1.29 | 1.29 | 1.29 | 1.29 | 0.0 (−0.02, 0.02) | −0.00 (−0.03, 0.03) |
| Weight (kg) | 2804 | 72.8 | 72.6 | 73.1 | 72.8 | 72.8 | 0 (−0.5, 0.5) | 0.0 (−1.0, 1.0) |
| Cholesterol level (mg/dl) | 3381 | 202 | 200 | 204 | 202 | 203 | 1.0 (−1, 3) | 1 (−2, 4) |
| Physiologic health | | | | | | | | |
| Diastolic blood pressure (mm Hg) | 3232 | 79.2 | 79.1 | 79.3 | 79.2 | 78.5 | 0.7 (−1.5, 0.02)‡ | 0.8 § (−1.7, 0.02) |
| Functional far vision (no. of Snellen lines) | 3477 | 2.55 | 2.50 | 2.51 | 2.52 | 2.42 | 0.1 (−0.16, −0.04)¶ | 0.13 (−0.20, −0.06) |
| Risk of dying (score) | 3417 | 1.01 | 0.98 | 1.03 | 1.01 | 0.99 | 0.02 (−0.05, 0.02) | 0.03 (−0.07, 0.02) |

*Numbers of persons in various parts of the analysis are dissimilar because noncompleters were not included for physiologic health, weight, cholesterol level and because of differences among measures in the number of persons with valid enrollment or exit data.

†Numbers in parentheses are 95 per cent confidence intervals; an approximate confidence interval is given for role functioning.

‡$t = 1.89$, $P = 0.06$.

§$t = 3.29$, $P = 0.001$. Persons with normal vision were included and given a value of 2.0.

## Table 7

### Predicted Exit Values for Physiologic Measures and Health Habits in Elevated-Risk Groups, According to Measure and Plan

| HEALTH HABITS AND PHYSIOLOGIC MEASURES | DEFINITION OF ELEVATED-RISK GROUP* | TOTAL COST-SHARING | FREE PLAN | FREE MINUS COST-SHARING+ |
|---|---|---|---|---|
| smoking | >= 1.79 (1 pack per day or more) | 1.75 | 1.73 | -0.02 (-0.06, 0.03) |
| weight | 20% over ideal weight (kg) | 89.1 | 89.4 | 0.3 (-1.1, 1.7) |
| cholesterol level | >= 220 mg/dl | 242 | 244 | 2 (-3, 7) |
| diastolic blood pressure | > 83 mm Hg or taking hypertension drugs at enrollment | 89.3 | 87.9 | -1.4 (-3.0, +0.1)** |
| functional far vision | line 3 (20/25) or worse for better eye | 2.98 | 2.78 | -0.2 (-0.3, -0.1)*** |
| risk of dying | risk > 1.42 | 2.11 | 1.90 | -0.21 (-0.49, -.04)++ |

*Elevated-risk group are the least healthy 25 per cent of the people as defined with respect to the individual health measure denoted in each row. For functional far vision, all persons with uncorrected natural vision worse than 20/20 are included.

**t = -1.79; p = .07.

***t = -3.29; p = .001.

+Numbers in parentheses are 95-percent confidence intervals.

++t = -2.41; p = .02.

## Table 8

### Differences Between Free and Cost-sharing Plans in Predicted Exit Values of Blood Pressure and Vision and the Risk of Dying, According to Initial Health Status and Income

| PHYSIOLOGIC MEASURES | ELEVATED RISK* | |
|---|---|---|
| | LOW INCOME | HIGH INCOME |
| Diastolic blood pressure | -3.3 (-5.9, -0.7) | -0.4 (-2.6, 1.8) |
| Functional far vision | -0.3 (-0.6, +0.02) | -0.1 (-0.4, 0.2) |
| Risk of dying | -0.30 (-0.60, -0.04) | -0.13 (-0.40, 0.10) |

*For definitions of elevated risk for diastolic blood pressure and risk of dying, see Table 7. For functional far vision, elevated-risk in this table refers only to upper one-quarter of the distribution of uncorrected natural vision. Predictions in these two columns are made using the mean value of the elevated-risk group. Numbers in parentheses are 95 per cent confidence intervals. All intervals that do not include 0 are significant at $P < 0.05$.

## Table 9

**Comparison of Likelihood of Using any Service, Likelihood of Hospitalization, and Imputed Annual Expenditure Among the Group Health Cooperative (GHC) and Fee-for-Service Plans.***

| PLAN | USE OF INPATIENT OF OUTPATIENT SERVICE IN YEAR | ONE OR MORE HOSPITALIZATIONS IN YEAR | IMPUTED ANNUAL EXPENDITURE PER PARTICIPANT (1983 DOLLARS)** |
|---|---|---|---|
| | % of participants | | |
| GHC experimental | 86.8 | 7.1 | 439 |
| | (1.0) | (0.50) | (25) |
| GHC control | 91.0 | 6.4 | 469 |
| | (0.8) | (0.55) | (66) |
| Fee-for-service | | | |
| Free | 85.3 | 11.1 | 609 |
| | (1.6) | (1.17) | (44) |
| 25% | 76.1 | 8.8 | 620 |
| | (2.7) | (1.37) | (103) |
| 95% | 68.4 | 8.5 | 459 |
| | (3.4) | (1.18) | (72) |
| Individual deductible | 73.9 | 7.9 | 413 |
| | (2.4) | (0.96) | (51) |

*The sample consists of all participants present at enrollment, while they remained in the Seattle area. Except for decedents, observations or partial years of participation have been deleted. Standard errors are in parentheses.

**Values include both in-plan and out-of-plan use by GHC participants. The method of imputing expenditure is described in the Manning et al. article. The t statistics for the difference in expenditure between the GHC experimental group and the five groups listed below it are 0.87, 3.22, 2.22, 0.30, and -0.56 respectively. Because of the inclusion of age and sex as covariates, these t statistics are larger than those that would be calculated from the standard errors shown in the table.

## Table 10

### Annual Rates of Admission and Face-to-Face Visits.*

| PLAN | ADMISSION RATE** | HOSPITAL DAYS | FACE-TO-FACE VISITS+ | PREVENTIVE VISITS++ |
|---|---|---|---|---|
| GHC experimental | 8.7<br>(0.67) | 49<br>(9.6) | 4.3<br>(0.14) | 0.55<br>(0.02) |
| GHC control | 8.3<br>(1.01) | 38<br>(9.0) | 4.7<br>(0.17) | 0.60<br>(0.02) |
| Fee-for-service | | | | |
| Free | 13.8<br>(1.51) | 83<br>(26) | 4.2<br>(0.25) | 0.41<br>(0.03) |
| 25% | 10.0<br>(1.43) | 87<br>(28) | 3.5<br>(0.35) | 0.32<br>(0.03) |
| 95% | 10.5<br>(1.68) | 46<br>(9.9) | 2.9<br>(0.34) | 0.29<br>(0.04) |
| Individual deductible | 8.8<br>(1.20 | 28<br>(5.1) | 3.3<br>(0.33) | 0.27<br>(0.03) |

*The sample includes all participants present at enrollment, while they remained in the Seattle area. For CHC control and experimental groups the data include both in- and out-of-plan use. Standard errors are in parentheses.

**A count of all continuous periods of inpatient treatment.

+Includes all visits involving face-to-face contact with health providers for which a separate charge would have been made in the fee-for-service system. Excludes radiology, pathology, pre- and post-natal care, speech therapy, psychotherapy, dental care, chiropractic, podiatry, Christian Science healing, and telephone contacts.

++Includes well-child care, immunizations, screening examinations, routine physical and gynecologic examinations, and visits involving Pap smears (other than for cancer). Excludes visits for prenatal care, vision and hearing. In the case of GHC, includes in-plan and out-of-plan visits.

END

FILMED

5-85

DTIC